United States Naval Academy
Mechanical Engineering Department

EM477 Computer-Aided Design

Catalog Description: EM477 Computer-Aided Design **Credit:** 3 (2-2-3)
A design course using the workstation environment and selected software in mechanisms. Solid modeling and finite element analysis are used to generate solutions based on performance related objectives.

Prerequisites: EM371 Introduction To Design

Textbooks: Link, R.E. and Miner, S.M., "EM477 Computer-Aided Design Lecture Notes"

Course Director: Assoc. Prof. R.E. Link

Objectives[1]:

1. To understand the use of computers and software as tools to solve engineering problems in a creative and efficient manner (a,b,c).
2. To improve the visualization and communication skills of the student (d).
3. To select design teams and develop a project proposal for the Capstone Design Course in the Spring (b,d).

Course Content:

No.	Topic or Subtopic	hrs.
1.	Mechanism Synthesis	4
2.	Kinematic Analysis of Mechanisms	6
3.	Dynamic Analysis of Mechanisms	2
4.	Engineering Drawings and Dimensioning	2
5.	Project Management	2
6.	Solid Modeling	8

Evaluation:

1. Quizzes	_X_ Yes	___ No
2. Homework	_X_ Yes	___ No
3. Exams	___ Yes	_X_ No
4. Laboratory Reports	_X_ Yes	___ No
5. Oral Presentations	___ Yes	_X_ No
6. Design Reports/Notebooks	_X_ Yes	___ No
7. Prototypes/Demonstrations	_X_ Yes	___ No
8. Projects	_X_ Yes	___ No
9. any other evaluation tools used	___ Yes	_X_ No

Acquired Abilities[2]:

1.1 Students will demonstrate the ability to use general purpose mathematics software packages to synthesize and analyze mechanism design problems (1,2,3,6).

1.2 Students will demonstrate the ability to use solid modeling packages to build assemblies and analyze the kinematic and dynamic behavior of mechanisms (4,6,8).
1.3 Students will manufacture physical prototypes of their designs to evaluate the actual performance of their designs (7).
2.1 Students will demonstrate the ability to use solid modeling packages to develop virtual prototype of mechanism designs (6,7,8).
2.2 Students will prepare written laboratory reports, formal design reports and informal status reports to communicate and present technical information (6).
3.1 Students will select a design team and topic for the Spring Capstone Design Course (2).
3.2 Students will prepare and submit a formal proposal for the Capstone Design Project (6).

Date of Latest Revision: 16 NOV 2001

[1] Letters in parenthesis refer to the Program Objectives of the Mechanical Engineering Program.
[2] Numbers in parenthesis refer to the evaluation methods used to assess student performance.